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10/551,373

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EXAMINER

KWON, ASHLEY M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

05/11/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/551,373 | Applicant(s) MITANI ET AL. | |
| | Examiner ASHLEY KWON | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>2/25/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

In response to the amendment received January 13, 2010:

- a. Claims 1-7 and 10-12 are pending;
- b. The previous prior art rejections have been withdrawn and new rejections made to the claims.

Claims Analysis

It is noted that a separator **for use in storage battery** is regarded as intended use. The Courts have held that if the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967); and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The Courts have held that it is well settled that the recitation of a new intended use, for an old product, does not make a claim to that old product patentable. See *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) (see MPEP § 2114). As such, the limitation requiring the separator *for use in storage battery* is not given patentable weight in claims 1-7 and 10-12.

Claim Objections

Claims 1 and 12 are objected to because of the following informalities: Applicant is asked to change "...the fiber orientation is **at** random in the longitudinal and **the** cross directions...." to "the fiber orientation is random in the longitudinal and cross directions...". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation that "the paper sheet is substantially free of entangled glass fibers" is not supported by the specification. Applicant is asked to either point to the specification where this amendment is supported.

Art Unit: 1795

Claims 1 and 12 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear how the glass fiber orientation of the separator can be both random and substantially free of entangled glass fibers. The Examiner believes that there is a high degree of entanglement in a wet process. For the purposes of this rejection, as long as the separator is formed by wet process, the paper sheet will be interpreted as being "substantially free of entangled glass fibers".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1795

Claims 1-6, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,478,829 (hereinafter "Zurgis") in view of US 4,129,674 (hereinafter "Hannes").

Regarding claim 1, Zguris discloses a separator for use in a storage battery comprising a paper sheet formed by wet process and mainly composed of glass fibers (see col. 1, lines 8-15).

Zguris fails to disclose that the glass fiber distribution is uniform in the longitudinal and cross directions of the separator, the fiber orientation is random in the longitudinal and cross directions of the separator, and the paper sheet is substantially free of entangled glass fibers.

However, Hannes teaches a uniform fibrous glass mat (10) wherein the glass fibers and fiber bundles are dispersed in a randomly oriented fashion within the mat (see col. 2, lines 35-59) (see fig. 1). It is understood that by teaching that the glass mat is uniform, that it would possess uniform fiber distribution in the longitudinal and cross directions of the mat. Uniformity would apply to all directions within the mat. It is also understood that by teaching that the glass fibers are dispersed in a randomly oriented fashion within the mat, that the fiber orientation is random in the longitudinal and cross directions of the separator. The use of a known technique to improve similar devices (methods or products) in the same way is likely to be obvious. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, C.). Therefore, it would have been obvious to one of ordinary skill in the art to use the method of making a uniform fibrous glass mat with glass fibers dispersed in

Art Unit: 1795

randomly oriented directions as taught by Hannes to the glass fiber separator taught by Zguris in order to increase the tearing resistance of the mat (see col. 2, lines 57-61).

Regarding claims 2, Zguris in view of Hannes does not explicitly teach a separator for use in storage battery according to claim 1, wherein the average value for a difference of a wicking velocity (time required for absorbing up to 5 cm height) between the longitudinal and the cross directions of the separator for use in storage battery is 11% or less.

However, it is reasonable to presume that an average value for a difference of a wicking velocity between the longitudinal and cross directions of the separator for use in storage battery being 11% or less is inherent to the separator taught by Zguris in view of Hannes. Support for said presumption is found in the use of like materials (i.e. glass fibers with uniform fiber distribution and random orientation in the longitudinal and cross directions) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Zguris in view of Hannes product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Regarding claim 3, Zguris in view of Hannes does not explicitly teach a separator for use in storage battery according to claim 2, wherein the average value for a difference of a wicking velocity (time required for absorbing up to 5 cm height) between the longitudinal and the cross directions of the separator for use in storage battery is 7% or less.

However, it is reasonable to presume that an average value for a difference of a wicking velocity between the longitudinal and cross directions of the separator for use in storage battery being 7% or less is inherent to the separator taught by Zguris in view of Hannes. Support for said presumption is found in the use of like materials (i.e. glass fibers with uniform fiber distribution and random orientation in the longitudinal and cross directions) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Zguris in view of Hannes product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Regarding claim 4, Zguris in view of Hannes teaches a separator (96, see fig. 8) according to claim 1, wherein the fiber distribution is uniform in the direction of the thickness of the separator, and the randomness of the fiber orientation in the longitudinal and the cross directions of the separator is uniform in the direction of the thickness of the separator. Hannes teaches a uniform fibrous glass mat (10) wherein the glass fibers and fiber bundles are dispersed in a randomly oriented fashion within the mat (see col. 2, lines 35-59) (see fig. 1). It is understood that by teaching that the glass mat is uniform, that it would possess uniform fiber distribution in the thickness direction of the mat. Uniformity would apply to all directions within the mat. It is also understood that by teaching that the glass fibers are dispersed in a randomly oriented fashion within the mat, that there would be random fiber orientation in the longitudinal and the cross directions of the separator that is uniform in the thickness direction.

Art Unit: 1795

Regarding claim 5, Zguris in view of Hannes does not explicitly teach a separator for use in a storage battery according to claim 4, wherein the average value for a difference of a wicking velocity (time required for absorbing up to 5 cm height) between the right-side and the back-side surfaces of the separator for use in storage battery is 17% or less.

However, it is reasonable to presume that an average value for a difference of a wicking velocity between the longitudinal and the cross directions of the separator for use in storage battery being 17% or less is inherent to the separator taught by Zguris in view of Hannes. Support for said presumption is found in the use of like materials (i.e. glass fibers with uniform fiber distribution in the thickness direction and random fiber orientation in the longitudinal and cross directions that is uniform in the thickness direction) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Zguris in view of Hannes product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Regarding claim 6, Zguris in view of Hannes does not explicitly teach a separator for use in a storage battery according to claim 5, wherein the average value for a difference of a wicking velocity (time required for absorbing up to 5 cm height) between the right-side and the back-side surfaces of the separator for use in storage battery is 10% or less.

However, it is reasonable to presume that an average value for a difference of a wicking velocity between the longitudinal and the cross directions of the separator for

Art Unit: 1795

use in storage battery being 10% or less is inherent to the separator taught by Zguris in view of Hannes. Support for said presumption is found in the use of like materials (i.e. glass fibers with uniform fiber distribution in the thickness direction and random fiber orientation in the longitudinal and cross directions that is uniform in the thickness direction) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would obviously have been present once the Zguris in view of Hannes product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

Regarding claim 10, Zguris in view of Hannes teaches a storage battery according to claim 1, wherein it is used for a valve regulated lead-acid battery (see col. 1, lines 9-10).

Regarding claim 11, Zguris in view of Hannes teaches a storage battery characterized by using a separator for use in storage battery according to claim 1. A storage battery is anticipated by a valve-regulated lead-acid battery, which is taught by Zguris in view of Hannes (see col. 1, lines 9-10)

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zguris in view of Hannes as applied to claim 1 above, and further in view of US 6,071,651 (hereinafter "Forte").

Regarding claim 7, Zguris in view of Hannes fail to disclose a separator for use in storage battery according to claim 1, wherein there is no difference in the surface

Art Unit: 1795

roughness between the right-side and the backside surfaces of the separator for use in storage battery and both of them are smooth.

However, Forte teaches a glass fibrous mat separator wherein the surfaces are smooth in order to facilitate the movement of electrode plates over the major surfaces of the separators and allow electrode plates and intermediate separators to easily and quickly form into a stack (see col.14, lines 41-49). Since the smooth surfaces facilitate the movement of electrode plates over the major surfaces of the separators, it is assumed that both sides of the resilient fibrous mat (right-side and backside surfaces) have the same, or nearly the same roughness. If the resilient fibrous mats had a different roughness on it right-side and backside surfaces, then one side would better facilitate the movement of electrode plates than the other side. The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. __,__, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). Therefore, it would have been obvious to one of ordinary skill in the art to make both surfaces of the separator taught by Zguris in view of Hannes smooth and of the same roughness in order to facilitate the movement of electrode plates over the major surfaces of the separators and allow electrode plates and intermediate separators to easily and quickly form into a stack (*Forte*: see col.14, lines 41-49).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zguris in view of Hannes and Forte.

Regarding claim 12, Zguris in view of Hannes teaches a separator for use in storage battery comprising a paper sheet formed by wet process and mainly composed of glass fibers in which the fiber distribution is uniform in the longitudinal and the cross directions of the separator, and the fiber orientation is at random in the longitudinal and the cross directions of the separator, and the paper sheet is substantially free of entangled glass fibers (see explanation above for claim 1),

Zurgis in view of Hannes fails to disclose that the average density of the separator is about 0.135 g/cm³ or about 0.140 g/cm³.

Forte teaches that fibrous mats particularly suited for applications such as battery separators, for sealed, starved electrolyte, lead/acid batteries, it is preferred to use glass microfibers with a weight range from about 75 to 150 g/m² (see col. 7, lines 56-66) and a thickness from about 0.01 to about 0.5 inches (see col. 8, lines 3-4). Using the information provided by Forte, one is able to obtain the densities claimed by applicant. With a weight of 75 g/m² and a thickness of 0.0219 in and 0.0211 in one obtains the densities 0.135 and 0.140 g/cm³ respectively. See below for in depth calculations.

$$\begin{aligned} 0.0219 \text{ in} &= 5.56 \times 10^{-4} \text{ m} \\ 0.0211 \text{ in} &= 5.36 \times 10^{-4} \text{ m} \\ \frac{75 \text{ g/m}^2}{5.56 \times 10^{-4} \text{ m}} &= 1.35 \times 10^5 \text{ g/m}^3 = 0.135 \text{ g/cm}^3 \\ \frac{75 \text{ g/m}^2}{5.36 \times 10^{-4} \text{ m}} &= 1.40 \times 10^5 \text{ g/m}^3 = 0.140 \text{ g/cm}^3 \end{aligned}$$

The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). Therefore it would have been obvious to one of ordinary skill in the art to apply the densities taught by Forte to the uniform fibrous glass mat taught by Zurgis in view of Hannes since they are particularly suited for battery separators.

Response to Arguments

Applicant's arguments filed 12/10/09 have been fully considered but they are not persuasive.

Applicant argues that it is known in that art “that the “wet process” produces a separator having short glass fibers with substantially no entangled glass fibers”. Applicant points to Zguris (US 6,306,539) to show that this is known in the art, but Examiner believes that Zguris is being misinterpreted. Zguris teaches that the wet process produces a sheet that has shorter fiber length and is **less** entangled for subsequent dispersion (col. 7, lines 1-4). However nowhere does Zguris claim that there is substantially no entangled glass fiber.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHLEY KWON whose telephone number is (571)270-7865. The examiner can normally be reached on Monday to Thursday 7:30 - 6 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ASHLEY KWON/
Examiner, Art Unit 1795

/PATRICK RYAN/
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